Squamous cell carcinoma invading the right temporomandibular joint in a Belgian mare

Case Report Rapport de cas

Squamous cell carcinoma invading the right temporomandibular joint in a Belgian mare

Melanie Perrier, Tobias Schwarz, Olga Gonzalez, Sabrina Brounts

Abstract — This report describes a rare case of squamous cell carcinoma invading the right temporomandibular joint, right guttural pouch, and calvarium. Radiography, computed tomography, and histopathology were performed in the diagnostic workup. Computed tomography depicted more accurately than radiography the invasive nature, exact location, and extent of the lesion.

Résumé — Carcinomes squameux envahissant l'articulation temporomandibulaire droite d'une jument belge. Ce rapport décrit un rare cas de carcinomes squameux envahissant l'articulation temporomandibulaire droite, la poche gutturale et la calotte crânienne. Une radiographie, une tomodensitométrie et une histopathologie ont été réalisées dans le bilan diagnostique. La tomodensitométrie a dépeint plus fidèlement que la radiographie la nature invasive, l'emplacement exact et l'étendue de la lésion.

(Traduit par Isabelle Vallières)

Can Vet J 2010;51:885–887

A 12-year-old Belgian mare was presented to the University of Wisconsin-Madison for evaluation of a chronic draining tract located 1 cm rostroventral to the base of the right pinna. The tract was first noticed approximately 2 mo prior to presentation. Treatment was initiated (antibiotics, anti-inflammatories, and daily flushing of the tract) with minimal response. Within the last 3 wk prior to presentation the mare had lost weight and had difficulty eating. The mare had a history of surgical removal of a histologically confirmed squamous cell carcinoma (SCC) from the medial canthus of her right eye (3rd eyelid) on 2 occasions. The date of the 1st surgery was unknown to the current owners but the latest surgery had been performed 2 y earlier.

Case description

Upon presentation, the mare was emaciated (body score 3/9) and appeared depressed but alert. A moderate amount of mucopurulent fluid was draining from the draining tract. Mild bilateral mucopurulent nasal discharge was also noted (right worse than left). Other aspects of the physical examination were within normal limits.

Neurologic examination revealed an obtunded animal with a wide-based stance and a head tilt to the right. Cranial nerve deficits were detected for the right trigeminal (V), facial (VII), vestibulocochlear (VIII), and hypoglossal (XII) nerves. The presence of cranial nerve deficits, lethargy, and head tilt to the ipsilateral side were suggestive of a central lesion. Differential diagnosis included neoplasia, trauma, abscess, guttural pouch infection, and arthritis, osteomyelitis, or sepsis of the right temporomandibular joint (TMJ) and/or temporohyoid joint.

Lateral and lateral oblique radiographs of the skull were taken and revealed small amounts of gravitational fluid with gas interface in the area of the conchofrontal sinus and around the ethmoid bone. On dorsoventral and lesion-oriented oblique radiographic projections, soft tissue swelling with internal mineralization was noted over the rostroventral aspect of the right pinna (Figure 1A). The radiolucent outline of the right guttural pouch was reduced (Figure 1B). Radiography confirmed the previously listed differential diagnosis but did not narrow it down, except for ruling out major trauma.

Given the extent of the clinical findings and poor prognosis, the mare was euthanized. Computed tomography (CT) of the head and histopathology were performed postmortem. Computed tomography of the severed head and cranial neck in ventral recumbency was performed using 5-mm slice width and interval (axial mode), medium- and high-frequency reconstruction algorithm, 45-cm diameter display field of view, 140 kV, 200 mA, and 1 s rotation time settings. Imaging findings included a compressed air-filled left guttural pouch and a fluid- and gas-distended right guttural pouch. The proximal part of the right stylohyoid bone was osteolytic but not fractured. The right tympanic bulla contained soft tissue material. There

Department of Large Animal Clinical Science, College of Veterinary Medicine, University of Tennessee, Knoxville, Tennessee 37996-4545, USA (Perrier); Department of Surgical Sciences (Schwartz, Brounts) and Department of Pathobiological Sciences (Gonzalez), School of Veterinary Medicine, University of Wisconsin-Madison, Madison, Wisconsin 53706-1102, USA.

Address all correspondence to Dr. Perrier; e-mail: mel_perrier@hotmail.com

Dr. Perrier's present address is 17 Rue Paul Sain, 84000 Avignon, France.

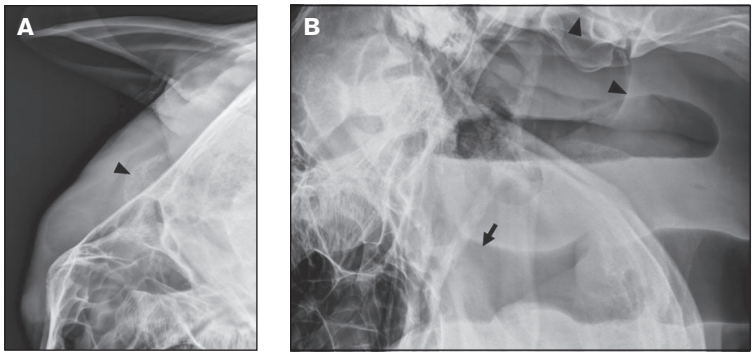

Figure 1. A – Lesion-oriented oblique radiograph of the right caudodorsal head demonstrating soft tissue swelling containing amorphous mineralization (arrowhead). B – Lateral radiograph of the caudal head and pharynx. One of the guttural pouches is fluid- and gas-distended, displacing the dorsal pharyngeal wall ventrally (arrow). An additional, smaller gas lucency representing the other guttural pouch is, visible in the dorsal neck area (arrowheads).

was extensive osteolysis of the right petrous temporal bone and tympanic bulla, the ramus, condyle, condylar and coronoid proccess of the right mandible and the right calvarium at the level of the middle ear (Figure 2A). The calvarial osteolysis was penetrating the internal margin of the brain case and thereby exposed the brain to the pathologic process. Marked irregular periosteal reaction was noted over the right temporal bone and mandible (ramus and coronoid process), zygomatic arch, and calvarium (Figure 2B). Soft tissue swelling with gas opacity was also noted just rostral to the right ear. Finally a small amount of free fluid was noted within the right frontal sinus and there was mild new bone formation over the medial aspect of the left TMJ.

The presumptive diagnosis was aggressive soft tissue neoplasia involving the right TMJ, secondary cranial cavity invasion, and right guttural tympany due to Eustachian tube obstruction. An infectious process could not be ruled out.

Necropsy and histopathology revealed a 9 cm × 9.5 cm necrotic area with green/tan inspissated debris at the center 1 cm rostroventral to the base of the right pinna. Irregular fragments of sequestrated bone were found within the lytic lesions. The right guttural pouch was filled with green/tan liquid. The wall of the right guttural pouch, superficial to the internal carotid, displayed irregular thickening of the submucosa by a white, multilobulated mass that bulged on cut section with bands of connective tissue separating the lobules. Similar tissue incorporated the right mandibular salivary gland and extended to the level of the right thyroid gland. There was severe bony lysis of the caudal ramus of the mandible. The largest identifiable lymph node in the cervical region measured 6 cm × 3 cm × 2 cm and there was neoplastic tissue partially effacing the nodal architecture. Retropharyngeal lymph nodes could not be identified but within the region there were coalescing masses of similar previously described firm and lobulated neoplastic tissue. Firm tan nodules measuring 1 to 3 cm in diameter were scattered throughout all lung lobes. No lesions were found in other organs.

At the level of the draining tract, sections of the skeletal muscle were partially effaced and replaced by anastomosing, moderately cellular islands of neoplastic epithelial cells. Neoplastic cells presented moderate to abundant eosinophilic cytoplasm, indistinct cellular borders with large oval to irregular nuclei, coarsely stippled chromatin, and simple to multiple prominent nucleoli. Mitotic figures ranged from 0 to 2 per high power field (HPF). There was moderate anisocytosis and anysokariosis. The same features were noted in the right guttural pouch and secondary metastasis to the lungs was also noted. At the request of the owner the head was not sectioned; therefore, detailed dissection was limited and extension into the calvarium and/or brain could not be assessed.

The histopathologic diagnosis was SCC of the right TMJ and right guttural pouch with metastasis to the lungs. It could not be determined with certainty whether or not the TMJ lesion was a metastasis from the previous right 3rd eyelid SCC or a primary neoplasia.

Discussion

Various pathologies of the equine TMJ have been reported, but they often remain unrecognized and are therefore underdiagnosed (1,2). Clinical signs may include but are not limited to dysphagia, masticatory problems, malocclusion, localized pain, fistulous tract formation, and neurological signs (1,3,4). Among the most commonly encountered conditions reported are degenerative joint disease, infection, and trauma; luxation and neoplasia are rare (1,2,5).

Squamous cell carcinoma is the 2nd most common tumor encountered in the horse (6). It is an epithelial neoplasia commonly located at the eyelids and external genitalia (6). Reports of SCC as primary tumors in other locations are isolated and rare (7–9). To the authors' knowledge, there is only 1 report describing a central vestibular syndrome secondary to neural SCC invasion in a horse and the metastatic nature of the lesion was suspected but not proven (8). Squamous cell carcinoma is often malignant and locally invasive with metastasis to regional lymph nodes and salivary glands (6). In up to 15% of the patients metastatic changes may also be seen in the lungs (6). The parotid lymph nodes are located very close to the TMJ and receive lymph from the eyelids, including the 3rd eyelids. One

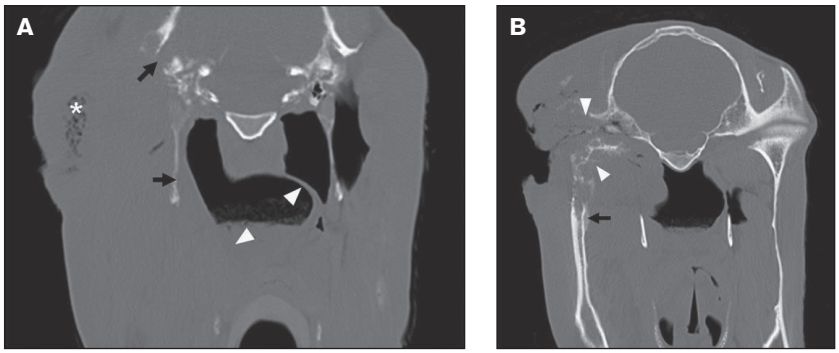

Figure 2. A – Transverse computed tomography images of the caudal head showing the right guttural pouch is fluid- and gas-distended (arrowheads), compressing its left counterpart. There is erosion of the right stylohyoid bone, petrous temporal bone, and calvarium (arrows). Notice the right external soft tissue swelling containing small gas bubbles (*). B – Transverse computed tomography images of the caudal head showing marked osteolysis of the right mandibular ramus and condyle as well as mandibular fossa of the temporal bone (arrowheads). There is also irregular periosteal reaction along the medial aspect of the right mandible (arrow).

hypothesis is that the SCC metastasized from the 3rd eyelid to the parotid lymph nodes; however, clinical presentation and histopathology could not be definitive in this matter. Given the history, previous histopathology results, and physical examination, we believe that in our case the primary lesion was the 3rd eyelid lesion followed by metastatic lesions in the TMJ and lungs.

Diagnostic techniques for TMJ diseases include clinical examination, palpation, arthrocenthesis, and imaging techniques (1,2). Imaging of the TMJ, however, can be challenging. Among the most commonly used techniques are radiography, ultrasonography, and scintigraphy (10,11). Magnetic resonance imaging (MRI) and CT have evolved to a gold standard for the equine head in recent years with several imaging anatomy (10,12–18) and pathology studies being available (18–20). In one report a lesion of the head or central nervous system in 8 of 12 horses presented for neurological disease localized rostral to the foramen magnum was identified with MRI (18). Similarly, a CT evaluation of head diseases in 15 horses was successful in diagnosing periosteitis, ethmoid hematomas, dental malformation, abscessation, neoplasia, and fractures (19).

In our case report, radiography accurately confirmed the presence of a clinically suspected lesion but CT substantially narrowed down the differential diagnosis. Intracranial extension, which carries a grave prognosis, was diagnosed with CT, but not radiography. Unfortunately, the limited necropsy performed at the owner's request prevented histological assessment of the extent of the lesion into the calvarium and/or brain, but previous reports (19,20) have demonstrated an accurate relationship between CT images and pathology findings. It is reasonable to assume that the lesion would also have been detected and described accurately intra vitam in a CT-unit suitable for live horses. Given the increasing availability of CT for equine patients this report emphasizes the diagnostic value of CT for equine patients with diseases of the head. CVJ

References

1. Moll DH, May KA. A review of conditions of the equine temporomandibular joint. In: AAEP Proceedings 2002;vol 2.
2. Baker GJ. Equine temporomandibular joints: Morphology, function and clinical disease. In: AAEP Proceedings 2002;vol 2.
3. Mayhew IG. Head tilt, circling, nystagmus and other signs of vestibular abnormalities. In: Large Animal Neurology: A Handbook for Veterinary Clinicians. Philadelphia: Lea and Febiger 1989:179–192.
4. Newton SA, Knottenbelt DC. Vestibular disease in two horses: A case of mycotic otitis media and a temporohyoid osteoarthropathy. Vet Rec 1999;145:142–144.
5. Hurtig MB, Barber SM, Farrow CS. Temporomandibular joint luxation in a horse. J Am Vet Assoc 1984;185:78–80.
6. Scott DW, Miller WH. Equine Dermatology. St. Louis, Missouri: Saunders, 2003:708–713.
7. Johnson PJ. Dermatologic tumors (excluding sarcoids). Vet Clin N Am Equine 1998:632–635.
8. D'Angelo A, Bertuglia A, Capucchio MT, Riondato F, Zanatta R, Gandini G. Central vestibular syndrome due to a squamous cell carcinoma in a horse. Vet Rec 2007;161:314–316.
9. McConnico RS, Blas-Machado U, Cooper VL, Reiners SR. Bilateral squamous cell carcinoma of the guttural pouchs and the left middle ear in a horse. Equine Vet Educ 2001;13:175–178.
10. Park RD. Radiographic examination of the equine head. Vet Clin N Am Equine 1993;9:49–74.
11. Weller R, Cauvin ER, Bowen IM, May SA. Comparison of radiography, scintigraphy and ultrasonography in the diagnosis of a case of temporomandibular joint arthropathy in a horse. Vet Rec 1999;144:377–379.
12. Rodriguez MJ, Soler M, Latorre R, Gil F, Agut A. Ultrasonographic anatomy of the temporomandibular joint in healthy pure-bred spanish horses. Vet Radiol Ultrasound 2007;48:149–154.
13. Tucker RL, Farrel E. Computed tomography and magnetic resonance imaging of the equine head. Vet Clin N Am Equine 2001;17:131–144.
14. Morrow KL, Park RD, Spurgeon TL, Stashak TS, Arceneaux B. Computed tomographic imaging of the equine head. Vet Radiol Ultrasound 2000;41:491–497.
15. Smallwood JE, Wood BC, Taylor WE, Tate LP. Anatomic reference for computed tomography of the head of the foal. Vet Radiol Ultrasound 2002;43:99–117.
16. Arencibia A, Vazquez JM, Rivero M, et al. Computed tomography of normal cranioencephalic structures in two horses. Anat Histol Embryol 2000;29:295–299.
17. Sasaki M, Hayashi Y, Koie H, et al. CT examination of the guttural pouch (auditory tube diverticulum) in Prezewalski's horse *(Equus przewalskii)*. J Vet Med Sci 1999;61:1019–1022.
18. Ferrell EA, Gavin PR, Tucker RL, Sellon DC, Hines MT. Magnetic resonance for evaluation of neurologic disease in 12 horses. Vet Radiol Ultrasound 2002;43:510–516.
19. Tietje S, Becker M, Bockenhoff G. Computed tomographic evaluation of head diseases in the horses: 15 cases. Equine Vet J 1996;28:98–105.
20. Warmerdam EPL, Klein WR, Van Herpen BPJM. Infectious temporomandibular joint disease in the horse: Computed tomographic diagnosis and treatment of two cases. Vet Rec 1997;141:172–174.